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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,520	03/19/2004	W. Farrell Edwards	UTAHST.002A	7539
20995	7590	12/16/2005	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			AWAI, ALEXANDRA F	
2040 MAIN STREET			ART UNIT	
FOURTEENTH FLOOR			PAPER NUMBER	
IRVINE, CA 92614			3663	

DATE MAILED: 12/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/804,520		EDWARDS ET AL.	
	Examiner		Art Unit	
	Alexandra Awai		3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 9, 11 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10 and 13-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/9/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of I, A, b, ii, (3) and AA and comments in the reply filed on 10/17/2005 are acknowledged. Applicant's examples of the generic nature of at least some of the claims are persuasive; claim 1 is generic. Applicant is advised that species A-D and a-c were included in the prior Office Action in order to facilitate future prosecution. Because Applicant did not distinctly and specifically point out the supposed errors in the restriction requirement (e.g., which guidelines were not followed), the election has been treated as an election without traverse (MPEP § 818.03(a)). The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-8, 10 and 13-17 have been examined, claims 9, 11 and 12 having been withdrawn.

Specification

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The specification does not describe in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make

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and/or use the invention. The creation the magnetic field prescribed by the parameter optimization and the assembling of the hardware to employ it is the subject matter of the allegedly novel feature of the invention. That is, upon determination of the unique parameters of a magnetic field that enables containment volumes smaller than were heretofore achievable, a novel apparatus is employed to implement said unique parameters. Making and using this novel apparatus requires undue experimentation by the skilled artisan as the particulars of this device are not described with regard to the features that elevate it from the conventional magnetic confinement technology.

As presently set forth, the “Confinement field generator” (Fig. 18, 366) is essentially a “black box” with no description of the internals thereof. The disclosure is insufficient in failing to set forth in an adequate and sufficient fashion, a description of component that would enable it to perform its intended function. If the applicant is of the opinion that there is a description in the prior art (in the form of literature, etc. having a date prior to the filing date of this application) of the internals of this black box, copies of said literature, etc. must be submitted for appropriate review by the Office. See *In re Ghiron et al.*, 169 USPQ 723, 727.

The disclosure fails to adequately describe how an actual embodiment of the invention might apply the standard equations (e.g., equations (1), (3) and (5)-(8)) and algebraic extrapolations presented. The specification apparently provides means for determining the desired plasma parameters, but does not establish how the parameters are implemented or what aspect of the present invention enables it to succeed in forming smaller confinement volumes where the conventional technology has failed. In effect, the disclosure describes the functioning of the embodiment in terms of the intended result, rather than the structure and the components

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that comprise it. The statute requires the applicant itself to inform, not to direct others to find out for themselves; In re Gardner et al, 166 U.S.P.Q. 138, In re Scarbrough, 182 U.S.P.Q. 298. Note that the disclosure must enable a person skilled in the art to practice the invention without having to design structure not shown to be readily available in the art; In re Hirsch, 131 U.S.P.Q. 198.

Claim Objections

5. Claims 15-17 are objected to Claim objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form. The current (claim 15), bulk motion of the charged particles (claim 16) and the flow of the charged particles (claim 17) represent the same phenomenon. The claims are effectively reciting an identical limitation.

Claim Rejections - 35 USC § 112

6. Claims 1-8, 10 and 13-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention as set forth in the objection to the specification. Moreover, as the specification is essentially a disclosure of a theoretical concept or object for continued study (i.e., new parameters to be implemented in an

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experimental device), it is not clear that the inventors, at the time the application was filed, had possession of an operative embodiment of the claimed invention.

7. Claims 1-8, 10 and 13-17 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Descriptions of components of the confinement field generator critical or essential to the practice of the invention, but not included in the claims are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). As discussed in the objection to the specification, it is not clear what novel aspect or aspects of the claimed apparatus allow it to implement the predetermined confinement parameters, while confinement field generators in the prior art are not so enabled.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 2-8, 10 and 13-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is indefinite as it is not clear how and in what manner the magnetic field influences the electrons and ions in order to effect the recited features. Although these features are discussed in the specification, the claims do not clearly communicate what is meant by “influences said electrons *substantially more*” and “*at least a partial separation*” (emphasis added). Therefore, the claim is so unduly vague as to be rendered indistinct.

With regard to claims 2-8, the language of the claims does not clearly set forth the metes and bounds of the claims, as the electron skin depth or electron scale length is itself a variable. Likewise, claim 14 is indefinite as the beta value used to define the operating parameters of the

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plasma is dependent upon factors that are not clearly set forth in the claim. Because these claim limitations are defined in terms of unknowns, one of ordinary skill in the art would not be able to ascertain the metes and bounds of the invention. Furthermore, there is no antecedent basis in the claims for the operating parameters of the plasma.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

11. Claims 1-8, 10 and 13-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Bass et al.

To the degree that the claims particularly point out the subject matter of the current invention they are anticipated by Bass et al., which disclose the following features:

- a plasma disposed within a containment volume (14) – claim 1,
- a magnetic field that influences electrons more than ions (e.g., 15 and 16 in indicating magnetic field lines)– claim 1,
- an electron confinement volume that may be defined as a multiple of the skin depth value (14) – claims 2-8,
- toroidal confinement (col. 74, line 58) – claim 10,
- confinement by a combination of z-pinch and theta-pinch (i.e., screw-pinch) (col. 32, line 62) – claim 13,

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- a beta value (col. 59, line 9) associated with the plasma that is relevant to the operating parameters – claim 14, and
- wherein the electrons make a greater contribution to the current than the ions – claims 15-17.

With regard to claim 1, note that the “wherein” and “so as to” clauses do not serve to further limit the structure of the claimed apparatus, but rather appear to describe conventional aspects of the actively claimed limitations (i.e., the plasma and the magnetic field). Plasma is by definition comprised of electrons and ions, and it is mathematical certainty that a magnetic field is capable of establishing directional drift that leads to charge separation. Therefore, the aforementioned clauses are not material to patentability. See MPEP § 2111.04 and 2115, which states:

“Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim.” *Ex parte Thibault*, 164 USPQ 666, 667 (BD. App. 1969)

“Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims.” *In re Young*, 75 F.2d 996, 26 USPQ 69 (CCPA 1935)

These conclusions are relevant to all of the claims, as essentially all limitations are drawn to the behavior and size of the plasma, rather than the plasma containment apparatus.

With regard to claims 2-8, given that the electron skin depth is a variable dependent upon electron densities and frequencies associated with the plasma, the electron confinement volume taught by Bass et al., which is at least part of the plasma confinement volume, reads upon the current claims. That is, given an electron skin depth of 2 cm, for example, there exists “a dimension” of the confinement volume that can be defined as 200 cm or 2.4 cm. Furthermore,

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the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device – for instance, relating to confinement volume – and a device having the claimed relative dimensions would not perform differently than the prior art device (i.e., that it may be used for the same purpose on a smaller scale), the claimed device was not patentably distinct from the prior art device. See In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984)

Regarding claims 10, 13 and 14, the limitations recited therein are entirely conventional, as evidenced by the lack of explanation of the physics involved in toroidal confinement and screw-pinch confinement within the current specification. Although the Bass et al. reference is drawn to toroidal confinement technology, screw-pinch confinement and the beta factor (as in a High-Beta Stellarator) are also discussed in the context of established knowledge (as denoted above by column and line number), so the reference teaches each of the claimed features. Furthermore, it is understood by those skilled in the art of magnetic plasma confinement that the operating parameters of a plasma *must* include factors relating to particle density, plasma temperature and magnetic field strength (see col. 9, Nomenclature table).

With regard to claim 15-17, it is inherent to any of the magnetic confinement devices disclosed by Bass et al. that the magnetic fields developed may lead to a greater current/bulk motion/flow of electrons, as an equal magnetic force applied to an ion and an electron will cause the electron to have a greater acceleration due to its smaller mass. As to limitations which are considered to be inherent in a reference, note the case law of In re Ludtke, 169 USPQ 563, In re Swinehart, 168 USPQ 226, In re Fitzgerald, 205 USPQ 594, In re Best et al., 189 USPQ, and In

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re Brown, 173 USPQ 685, 688. Note that implementation of the force-free phenomena discussed in the admitted prior art would likewise be considered non-novel, as such knowledge was disseminated decades ago, barring the disclosure of a novel structure to facilitate said implementation.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexandra Awai whose telephone number is (517) 272-3079.

The examiner can normally be reached on 9:30-6:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AA


JACK KEITH
SUPERVISORY PATENT EXAMINER